

Vaccine Storage and Handling

**Epidemiology and Prevention of Vaccine-
Preventable Diseases**

**National Center for Immunization and
Respiratory Diseases
Centers for Disease Control and Prevention**

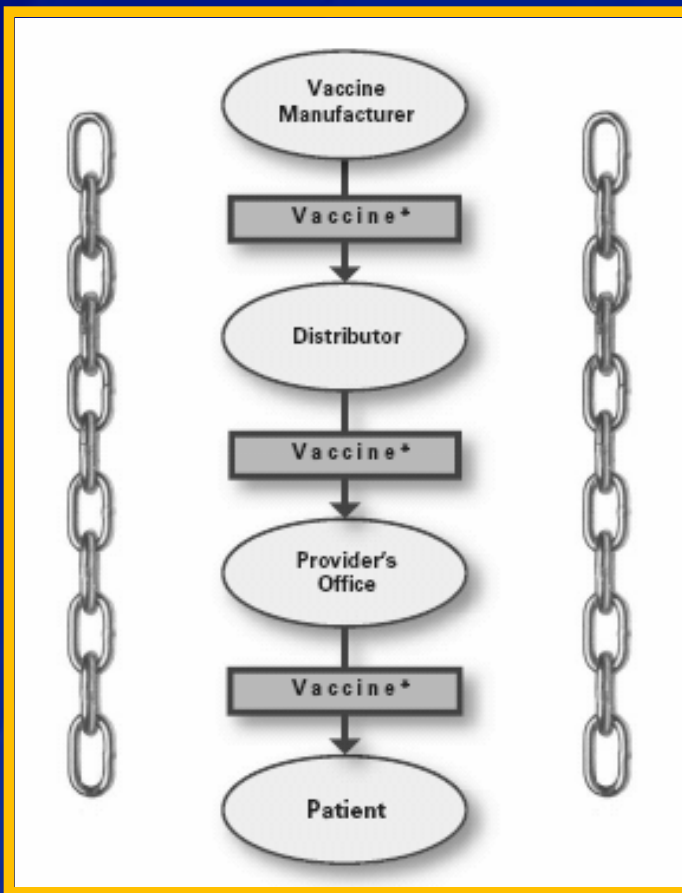
Revised March 2012

Vaccine Storage and Handling

- ❑ Success against vaccine-preventable diseases due in part to proper storage and handling**
- ❑ Storage and handling errors**
 - reduced potency and effectiveness
 - cost thousands of dollars in wasted vaccine and revaccination
 - loss of patient confidence
- ❑ It is better to not vaccinate than to administer a dose of vaccine that has been mishandled**

Cold Chain

(a temperature-controlled supply chain)



- ❑ **Vaccines must be stored properly from the time they are manufactured until they are administered to patients**
 - manufacturer to office
 - office to patient

Vaccine Storage Temperatures

❑ Live vaccines

- most tolerate freezing
- deteriorate rapidly after removal from storage

❑ Inactivated vaccines

- damaged by exposure to temperature fluctuations (extreme heat or freezing temperatures)

❑ Potency negatively affected by extended or multiple temperature excursions

Recommended Temperatures

Freezer	Between -58°F and +5°F (between -50°C and -15°C)
Refrigerator	Between 35°F and 46°F (between 2°C and 8°C)
average	40°F (5°C)

Vaccine Storage and Handling Plans

- ❑ **Develop and maintain written routine plan for:**
 - ordering and accepting vaccine deliveries;
 - storing and handling vaccines;
 - managing inventory; and,
 - managing potentially compromised vaccines
- ❑ **Develop and maintain written emergency vaccine retrieval and storage plan**
 - backup storage location with appropriate storage units, temperature monitoring capability, and backup generator
 - adequate coolers or refrigerated truck

Personnel, Training and Education

- ❑ Assign responsibilities to a primary vaccine coordinator**
- ❑ Designate at least one backup person**
- ❑ Provide training and continuing education on vaccine storage and handling for staff**

Vaccine Coordinator Responsibilities

- ❑ Ordering vaccines**
- ❑ Overseeing proper receipt and storage of shipments**
- ❑ Organizing vaccines within storage unit(s)**
- ❑ Temperature monitoring of storage unit(s) at least twice daily**
- ❑ Recording temperature readings on log**
- ❑ Daily physical inspection of storage unit(s)**
- ❑ Rotating stock so that vaccine closest to its expiration date will be used first**

Vaccine Coordinator Responsibilities

- ❑ Monitoring expiration dates and removing expired vaccine**
- ❑ Responding to potential temperature excursions**
- ❑ Overseeing proper vaccine transport**
- ❑ Maintaining storage and handling documentation**
- ❑ Maintaining storage equipment and records**
- ❑ Maintaining VFC program documentation in participating clinics**
- ❑ Ensuring adequate staff training**

Training and Education

❑ Personnel who

- handle or administer vaccines
- accept vaccine shipments
- have access to vaccine storage unit(s)

❑ Provide training and continuing education when

- new or temporary staff are oriented
- new vaccines are stocked
- changes in storage and handling guidelines occur

Vaccine Storage Equipment

- ❑ Select carefully; use properly; maintain regularly; monitor consistently**
- ❑ Consult immunization program for any specific requirements**
- ❑ Keep an equipment logbook**
 - equipment serial number
 - equipment installation date
 - dates of routine maintenance
 - dates of service/repairs and contact information on service provider
 - equipment instructions

Freezers and Refrigerators

- ❑ Stand alone freezers and refrigerators without freezers are strongly recommended (frost-free or automatic defrost are preferred)**
- ❑ Freezer and refrigerator compartments must each have own exterior door and thermostat controls**
- ❑ Able to maintain required temperature range throughout year**
- ❑ Dedicated to storage of biologics**
- ❑ Large enough to hold year's largest vaccine inventory without crowding (including flu vaccine)**

Storage Unit Placement

- ❑ **Promote good air circulation around storage unit**
 - place in well ventilated room
 - allow for space on all sides and top
 - allow minimum of 4 inches between storage unit and a wall
 - do not block motor cover
 - ensure unit stands level with at least 1-2 inches between bottom of unit and floor

Dormitory-style Refrigerator

- ❑ **Small combination freezer/refrigerator unit with one external door and an evaporator plate (cooling coil), which is usually located inside an icemaker compartment (freezer) within the refrigerator**
- ❑ **NOT recommended for vaccine storage**

Dormitory-style Freezer-Refrigerator

- ❑ NOT recommended for vaccine storage



Thermometers



Digital



Bio-safe Liquid



Continuous-Graphic



Minimum/ Maximum

Thermometers

- ❑ **Use calibrated thermometers with a Certificate of Traceability and Calibration from an ISO 17025 accredited testing lab, NIST, or another internationally recognized standards agency**
 - digital
 - bio-safe liquid
 - continuous graphic
 - minimum/maximum

Monitor Temperatures Twice Daily

Keep Logs for at Least 3 Years

Temperature Log for Vaccines (Fahrenheit)

Month/Year: _____ Days 1–15

Completing this temperature log: Check the temperatures in both the freezer and the refrigerator compartments of your vaccine storage units at least twice each working day. Place an "X" in the box that corresponds with the temperature and record the ambient (room) temperature, the time of the temperature readings, and your initials. Once the month has ended, save each month's completed form for 3 years, unless state or local jurisdictions require a longer time period.

If the recorded temperature is in the shaded zone: This represents an unacceptable temperature range. Follow these steps: 1. **Store the vaccine** under proper conditions as quickly as possible. 2. **Call the vaccine manufacturer(s)** to determine whether the potency of the vaccine(s) has been affected. 3. **Call the immunization program** at your local health department for further assistance: (____) _____. 4. **Document the action** taken on the reverse side of this log.

Day of Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Staff Initials															
Room Temp.															
Exact Time															
°F Temp	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am
• 49°															
48°															
47°															
46°															
45°															
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• 32°															
• 8°															
7°															
6°															
5°															
4°															
• 3°															

Adapted by the Immunization Action Coalition courtesy of the Michigan Department of Community Health and the California Department of Health Services.

Technical content reviewed by the Centers for Disease Control and Prevention, Dec. 2010.

www.immunize.org/catg.d/p3039.pdf • Item #P3039 (1/2/10)

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Temperature Monitoring

- ❑ Temperatures in both the freezer and refrigerator units should be read and recorded twice each day**
 - once in the morning and once before leaving at the end of the workday
- ❑ Post temperature log on the door of the storage unit**
- ❑ Keep temperature logs for at least 3 years unless state statutes or rules require a longer period**

Vaccine Placement and Labeling

- ❑ Store vaccine away from unit walls, coils, and vents**
- ❑ Keep vaccines in original packaging**
- ❑ Stack in rows with same type of vaccine**
- ❑ Use uncovered storage containers with slotted sides or openings**
- ❑ Use labels with vaccine names and age indications or color coding**
- ❑ Protect vaccine from light**

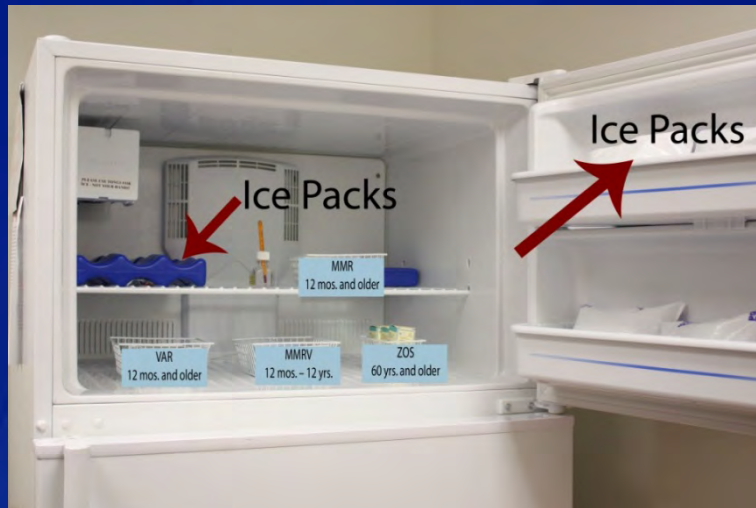
Diluent Storage

- ❑ Diluent is shipped with the corresponding vaccine**
- ❑ Store diluent as directed in manufacturer's product information**
- ❑ Store refrigerated diluent with corresponding vaccine (these diluents may contain vaccine antigen)**
- ❑ Do not freeze diluents**
- ❑ Label diluent to avoid inadvertent use of the wrong diluent when reconstituting a vaccine**

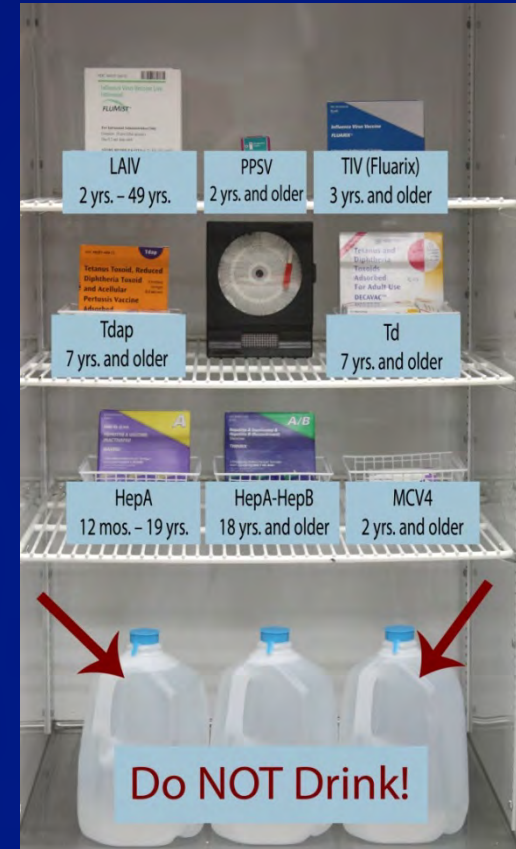
Preventive Measures

- ❑ Plug unit directly into wall; do NOT use multi-strip outlet**
- ❑ Use a plug guard or safety-lock plug**
- ❑ Install a temperature alarm**
- ❑ Label circuit breakers**
- ❑ Use water bottles in the refrigerator and ice packs in the freezer to maintain temperature**

Use Ice Packs and Water Bottles to Maintain Temperature



Freezer



Refrigerator

Preventive Measures

- ❑ Do NOT store vaccine in vegetable/fruit bins, deli drawers, or doors**
- ❑ Perform daily inspection of storage unit(s)**
- ❑ If other biologics must be stored in the same unit, store them BELOW the vaccines to avoid contamination**
- ❑ Never store food and beverages in the same unit with vaccines**
- ❑ Take immediate corrective action when there is a problem**

Vaccine Inventory Control

- ❑ **Conduct a monthly vaccine and diluent inventory**
- ❑ **Order vaccine responsibly based on**
 - projected demand
 - storage capacity
 - Current supply
- ❑ **Request delivery during office hours**

Expiration Dates

- ❑ Monitor vaccine and diluent expiration dates closely**
- ❑ Rotate stock so that vaccine and diluent with shortest expiration dates are used first**
- ❑ If normal in appearance and stored and handled properly, product can be used**
 - through end of day indicated if expiration date is mm/dd/yyyy (e.g., 12/15/2012 – use through 12/15/2012)
 - through end of month indicated if expiration date is mm/yyyy (e.g., 12/2012 – use through 12/31/2012)

Expiration Dates

❑ **Multidose vials**

- can be used through expiration date on label unless otherwise stated in manufacturer's product information
- mark with date first opened

❑ **Reconstituted vaccine**

- once reconstituted use within timeframe indicated by manufacturer or discard

❑ **Never use expired vaccine or diluent**

Vaccine Shipments

- ❑ **Inspect vaccine shipments**
 - container
 - contents
 - shipping temperature monitors/indicators
- ❑ **If there are concerns, store vaccines properly, but segregate from other vaccines and mark "Do NOT Use"**
- ❑ **Consult immunization program or vaccine manufacturer for guidance**

Vaccine Transport to Off-Site Clinics

- ❑ Maintain cold chain at all times**
- ❑ Contact immunization program for specific policies regarding vaccine transport**
- ❑ Diluent should travel with its corresponding vaccine**
- ❑ Monitor temperature hourly if vaccine kept in cooler during off-site clinic**
- ❑ Patient transport of vaccine (e.g., zoster) from pharmacy to clinic for administration is not an acceptable transport method for any vaccine**

Transport of Varicella-Containing Vaccine to Off-Site Clinics

- ❑ CDC and the manufacturer do not recommend transporting varicella-containing vaccines to off-site clinics**
- ❑ If vaccine must be transported use a portable freezer that maintains the temperature between -58°F and +5°F (-50°C and -15°C)**
- ❑ Do NOT use dry ice**
- ❑ Varicella-containing vaccines may be transported at refrigerator temperature between 35°F and 46°F « (2°C and 8°C), for up to 72 continuous hours prior to reconstitution**
- ❑ Must use the guideline in the Vaccine Storage and Handling Guide**

Do Not Prefill Syringes

- ❑ Increases the risk for administration errors**
- ❑ Wasted vaccine**
- ❑ Possible bacterial growth in vaccines that do not contain a preservative**
- ❑ Administration syringes not designed for storage**
- ❑ Any syringes prefilled by the provider must be stored at the recommended temperature range and used that day or discarded at the end of the work day**

Prefilling Syringes

- ❑ Consider using manufacturer-filled syringes for large immunization events because they are designed for both storage and administration**
- ❑ Do not “activate” (remove syringe cap or attach needle) until ready to administer the vaccine; “activation” breaks the sterile seal**
- ❑ Any unused activated syringe should be discarded at end of work day**

Vaccine Disposal

- ❑ Consult immunization program or vaccine manufacturer regarding returnable vaccines**
- ❑ Vaccines that are not returnable should be discarded as medical waste according to state guidelines**

CDC Vaccines and Immunization

Contact Information

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